

FURTHER CONSIDERATIONS IN STYLOSANTHES (LEGUMINOSAE)

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Since publication of the writer's "A Revision of the Genus *Stylosanthes*" in 1957, additional collections and further study have resulted in an increase in number of species in the genus. Nootboom (1961), after studying considerable Malaysian material, has pointed out some errors in this writer's revision. These are corrected in this paper. New illustrations of the lomenta of each species are provided. These have been prepared by Miss Miriam Hope Wysong.

The species of *stylosanthes* have been divided into two sections from the time of Vogel (1838). It is unfortunate in choosing the type species for the genus from Swartz' *S. viscosa* and *S. procumbens* (= *S. hamata* (L.) Taub.) that I selected the latter, rather than *S. viscosa* which belongs to Vogel's Section Eu-*Stylosanthes*. Vogel's sectional names are valid, and should be recognized. The correct nomenclature of the sections follows:

SECTION STYLOSANTHES

Sect. *Eu-Stylosanthes* Vog. in *Linnaea* 12:63. 1838. *Astyposanthes* Herter, in *Rev. Sudamer. Bot.* 7:209. 1943. Sect. *Astyposanthes* (Herter) Mohl. in *Ann. Mo. Bot. Gard.* 44:327. 1957.

None of the flowers subtended by an axis rudiment; inner bracteole usually 1.

Type: *Stylosanthes viscosa* Sw.

SECTION STYPOSANTHES Vog. in *Linnaea* 12:68. 1838.

Sect. *Stylosanthes* sensu Mohl. (1957).

Each flower, or at least the lower, subtended by an axis rudiment; inner bracteoles usually 2.

Type: *Stylosanthes hamata* (L.) Taub.

Although Taubert described *S. sundaica* in 1891 in Section *Styposanthes*, I reduced it to *S. humilis* (a species with similar lomenta in Section *Stylosanthes*) because I could find no trace of an axis rudiment in the scanty material at

my disposal. Nootboom (1961), with ample material for study, reports the presence of an axis rudiment, albeit caducous, so that *S. sundaica* should be recognized as a valid species belonging to Section *Stylosanthes*.

Five species of *Stylosanthes* are recognized in this paper which were not recorded in the author's revision in 1957. These are *S. ingrata*, *S. mucronata*, *S. suborbiculata*, *S. suffruticosa*, and *S. sundaica*.

KEY TO THE SECTIONS OF STYLOSANTHES

- A. Each flower, or at least the lower flowers, subtended by an axis rudiment; inner bracteoles usually 2 (1 in *S. sericeiceps*) Section *Stylosanthes*
- AA. None of the flowers subtended by an axis rudiment; inner bracteole usually 1 Section *Stylosanthes*

KEY TO THE SPECIES OF SECTION STYLOSANTHES

- A. Bracts (8-) 10-15 mm. broad, with 11-21 conspicuous and usually broad, colored nerves.
 - B. Fertile articulations of the loment often 2, the upper glabrous, the beak less than one-third as long as the upper articulation, glabrous or with a very few short stiff hairs; nerves of the bracteal sheath usually 15; stems usually with scattered bristles. Brazil, Venezuela. (Fig. 1) 1. *S. capitata*
 - BB. Fertile articulation of the loment 1, pilose, the beak only slightly shorter than the upper articulation, pilose; nerves of the bracteal sheath usually 21; stems pilosulous to villous. Brazil, Paraguay. (Fig. 2) 2. *S. bracteata*
- AA. Bracts at most 10 mm. broad, with fewer than 15 nerves which are inconspicuous.
 - C. Beak of the loment straight or only slightly curved; leaflets glabrous on both surfaces (rarely with marginal cilia); teeth of the upper stipules mostly longer than the sheath. Florida, Central America, Mexico, Bahamas, Cuba. (Fig. 3) 3. *S. calcicola*
 - CC. Beak of the loment uncinuate or circinate; leaflets usually pubescent, at least on the lower surface (occasionally glabrous in *S. erecta* of Africa and *S. hamata* of the West Indies); sheath of the upper stipules mostly longer than the teeth.
 - D. Loment completely glabrous or with some pubescence on the beak only or occasionally on the nerves in *S. mexicana*.
 - E. Stems sericeous or bristly; leaflets sparsely but conspicuously bristly-ciliate; loment often green, with both articulations usually fertile; inflorescence obovoid. Mexico, Venezuela, Bolivia. (Fig. 4) 4. *S. mexicana*

- EE. Stems glabrous or puberulent above; leaflets without bristly cilia; loment brown, with only one articulation usually fertile; inflorescence often narrow. West Africa. (Fig. 5)
 5. *S. erecta*
- DD. Loment pubescent on the body and usually on the beak.
- F. Stem and bracts bearing tuberculate-based hairs (sometimes merely with tubercles); lower surface of leaflets usually villous with interspersed tuberculate bristles; beak of the loment usually shorter than the upper articulation (except in *S. sundaica* and sometimes in *S. fruticosa*, *S. macrocarpa*, and *S. nervosa*).
- G. Beak of the loment half to one-third the length of the upper articulation.
- H. Bracts shortly scabrous-hispid; inflorescence usually nearly as broad as long; beak of the loment short-bristly.
- I. Leaflets often punctate beneath, obtuse; stem bearing short dark setae, the whole aspect of the plant dingy brown; fertile articulation usually 1, pubescent throughout. Brazil, Ecuador, Venezuela, Colombia, Bolivia. (Fig. 6) 6. *S. scabra*
- II. Leaflets not punctate beneath, acute; stem setose or puberulent to densely pilose, not dingy brown; fertile articulations often 2, pilosulous only on the ribs. Bahamas, Cuba, Colombia, Venezuela, Peru. (Fig. 7)
 7. *S. tuberculata*
- HH. Bracts villous or with long tuberculate bristles; inflorescence often 2-3 times longer than broad; beak of the loment usually rufous-pilose.
- J. Bracts softly villous and rarely with tuberculate bristles; inflorescence 2-3 times longer than broad; loment 1.0-1.5 mm. broad, the beak rufous-pilose. Ecuador, Peru, Galápagos Islands. (Fig. 8)
 8. *S. sympodialis*
- JJ. Bracts with tuberculate bristles; inflorescence about as broad as long; loment 1.5-2.5 mm. broad, the beak puberulent.
- K. Beak of loment 1.5-3.0 mm. long; stems evenly pubescent. Africa. (Fig. 9) 9. *S. mucronata*
- KK. Beak of loment 3.5-4.0 mm. long; stems unilaterally pubescent. Ceylon, India. (Fig. 10)
 10. *S. fruticosa*
- GG. Beak nearly equaling to exceeding the upper articulation.
- L. Beak of the loment strongly circinate.
- M. Beak longer than body of loment; stems not sericeous. East Indies. (Fig. 11) 11. *S. sundaica*

- MM. Beak and body of loment about equal in length; stems sericeous. Honduras, Mexico. (Fig. 12)
 12. *S. subsericea*
- LL. Beak of the loment curved to strongly uncinata; bracteal sheath and stem with tuberculate bristles but not sericeous.
- N. Upper articulation and beak combined 7.5-8.5 mm. long, the beak about equaling the upper articulation; plants to 0.2 m. long. Mexico. (Fig. 13)
 13. *S. macrocarpa*
- NN. Upper articulation and beak combined 5.0-7.5 mm. long, the beak sometimes slightly shorter than the upper articulation; plants to 1 m. tall.
- O. Fertile articulations mostly 2; bracteal sheath usually bearing long tuberculate-based bristles; leaflets elliptic, obtuse to sub-acute, usually puberulent.
- P. Beak of loment 1.5-3.0 mm. long; stems evenly pubescent.
- Q. Terminal leaflet 8-10 mm. long. British Guiana. (Fig. 14) 14. *S. suffruticosa*
- QQ. Terminal leaflet 15-25 mm. long. Africa. (Fig. 9) 9. *S. mucronata*
- PP. Beak of loment 3.5-4.0 mm. long; stems unilaterally pubescent. Ceylon, India. (Fig. 10)
 10. *S. fruticosa*
- OO. Fertile articulation usually 1; bracteal sheath short-hispid to densely ciliate; leaflets usually oblanceolate, acute to acuminate, glabrous or occasionally hispid beneath. Venezuela, Peru, Bolivia, Argentina. (Fig. 15) 15. *S. nervosa*
- FF. Stem and bracts pilose, villous, or nearly glabrous, lacking tuberculate bristles; lower surface of leaflets pilose or appressed-villous or glabrous, never with tuberculate bristles; beak of the loment equaling or exceeding the upper articulation (except *S. sericeiceps*).
- R. Beak of the loment equaling or exceeding the upper articulation; pubescence of the bracteal sheath whitish; stem usually not pubescent throughout. Florida, Bahamas, Cuba, Central America, Colombia, Venezuela. (Fig. 16) 16. *S. hamata*
- RR. Beak of the loment about one-half as long as the upper articulation; pubescence of the bracteal sheath tan or rufous; stem often pubescent throughout.
- S. Loment pubescent throughout; leaflets glabrous above, 15-26 mm. long; bracteal sheaths tan-pilose. Venezuela.

- (Fig. 17) 17. *S. sericeiceps*
 SS. Loment pubescent above, glabrous below; leaflets minutely pubescent above, 20-40 mm. long; bracteal sheaths rufous-pilose. Peru, Ecuador, Galápagos Islands. (Fig. 8) 8. *S. sympodialis*

KEY TO THE SPECIES OF SECTION STYLOSANTHES

- A. Beak of the loment minute, at most about one-fifth as long as the upper articulation, the fertile articulation 1.
 B. Fertile articulation shortly hairy throughout or rarely glabrous, terete, 2.5-5.0 mm. long. Eastern United States. (Fig. 18)
 18. *S. biflora*
 BB. Fertile articulation minutely tuberculate near the apex or rarely with a few scattered appressed white hairs, flattened, 1.5-3.0 mm. long. Bahamas, Central America, Mexico, South America. (Fig. 19) 19. *S. guyanensis*
 AA. Beak of the loment from one-fourth as long to exceeding the upper articulation, the fertile articulations 1 or 2.
 C. Leaflets 0.5-2.0 mm. broad; inflorescence very narrow and elongate; beak of the loment strongly uncinete, often 2-3 times as long as the pubescent upper articulation. Brazil, Guianas. (Fig. 20) 20. *S. angustifolia*
 CC. Leaflets 2-6 mm. broad; inflorescence usually capituliform, globose to ovoid or obovoid; beak of the loment various.
 D. Loment glabrous (occasionally pubescent only on the beak).
 E. Loment with 2 fertile articulations, the beak straight or uncinete; bracteal leaflets stalked.
 F. Beak straight or nearly so, about equaling the upper articulation, beak and upper articulation together about 5-6 mm. long; bracts, leaflets, and stems densely short-bristly. Brazil, Uruguay, Paraguay. (Fig. 21)
 21. *S. leiocarpa*
 FF. Beak uncinete, one-third as long as the upper articulation, beak and upper articulation together 3.0-3.5 mm. long; bracts and sometimes the leaflets and the stems with scattered long bristles, often glabrous. French Guiana. (Fig. 22). 22. *S. cayennensis*
 EE. Loment with one fertile articulation, often two in *S. ingrata* the beak strongly uncinete or circinate; bracteal leaflets sessile or subsessile.
 G. Loment conspicuously reticulate-nerved, about as broad as long (excluding the beak); inflorescence 4- to 8-flowered. Uruguay, Argentina. (Fig. 23) 23. *S. hippocampoides*
 GG. Loment obscurely nerved, a little longer to twice as long as broad (excluding the beak); inflorescence 2- to 4-flowered.

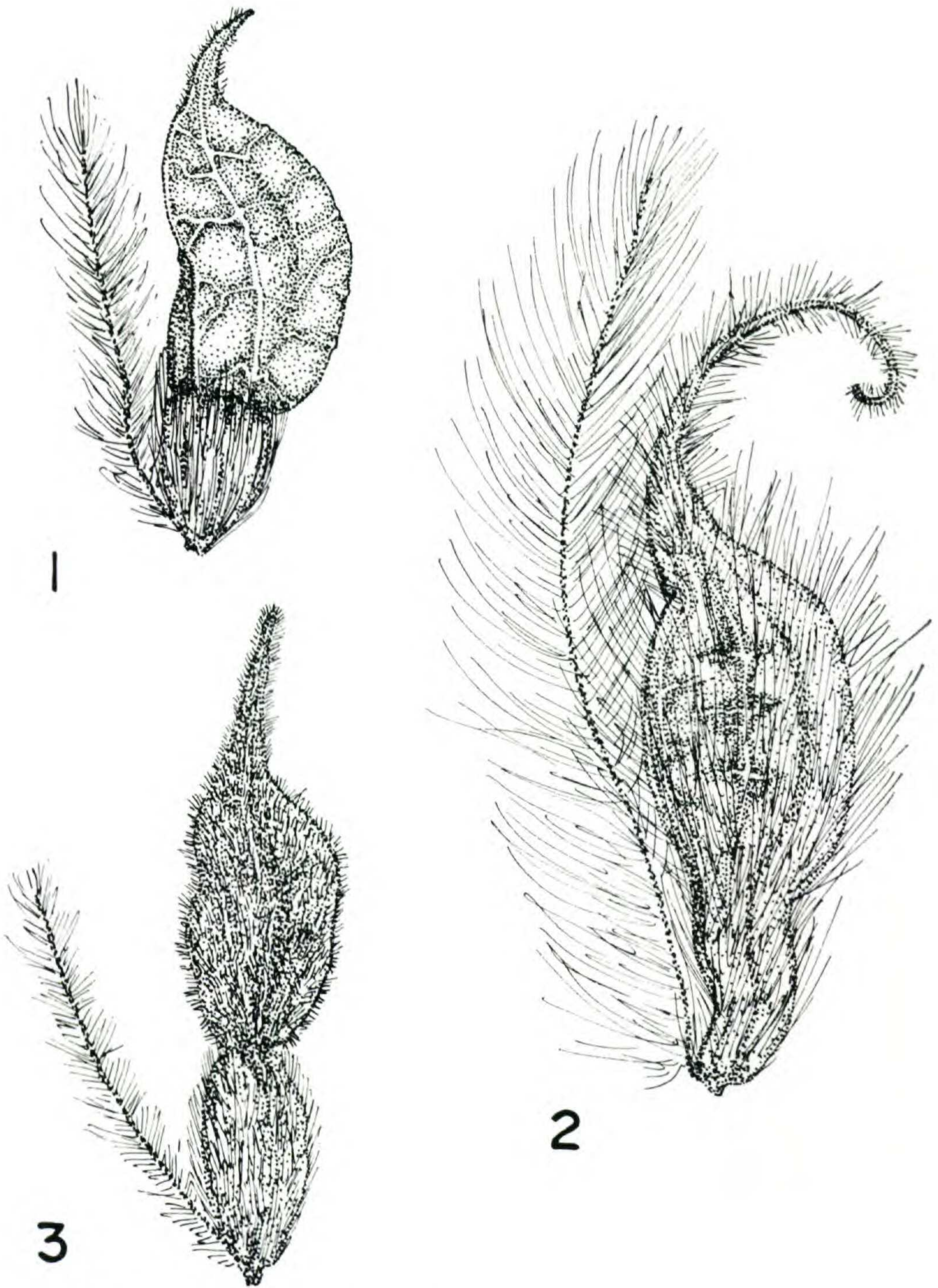


Fig. 1. *Stylosanthes capitata*, $\times 10$.

Fig. 2. *Stylosanthes bracteata*, $\times 10$.

Fig. 3. *Stylosanthes calcicola*, $\times 10$.

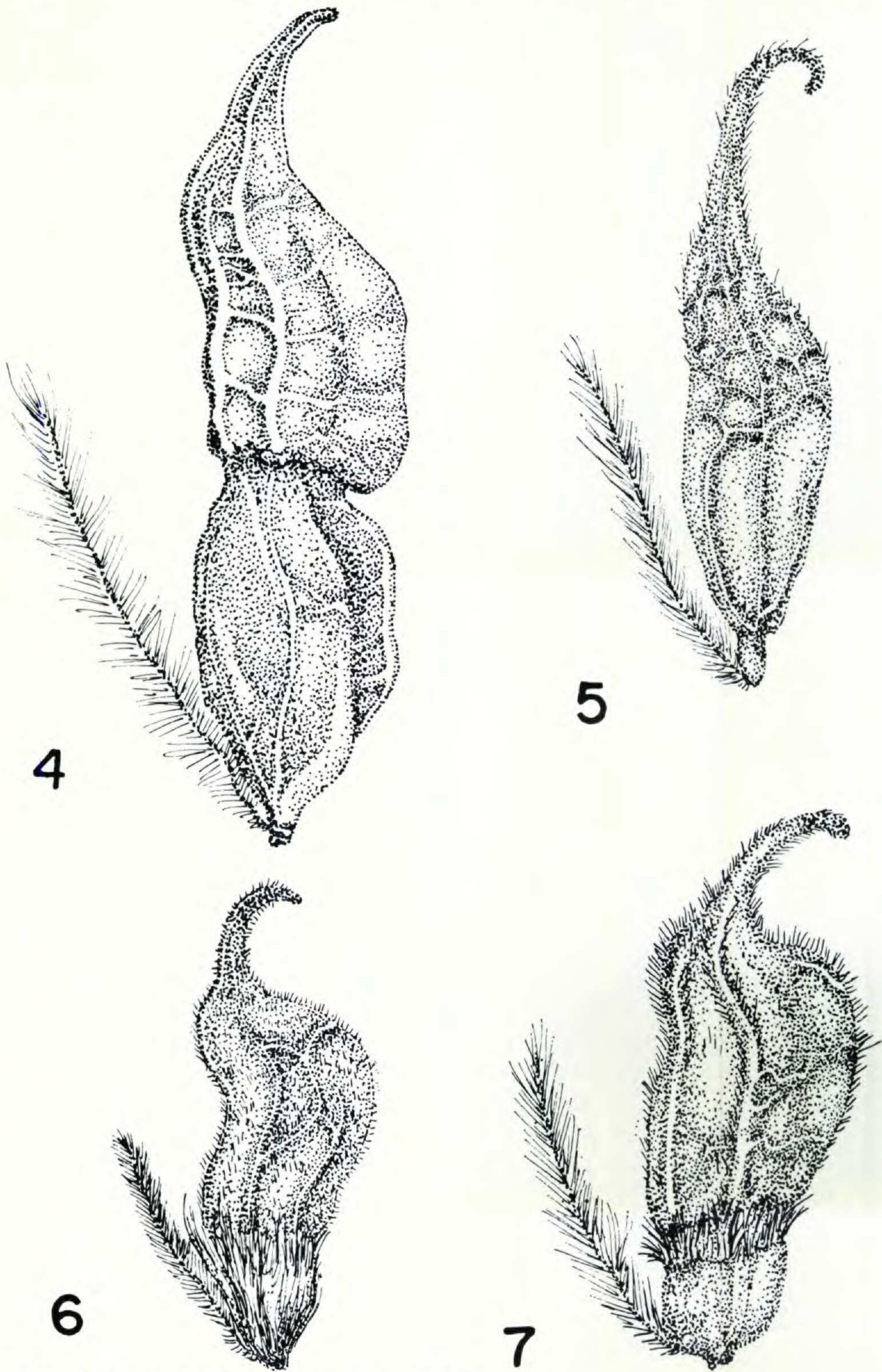


Fig. 4. *Stylosanthes mexicana*, $\times 10$.

Fig. 5. *Stylosanthes erecta*, $\times 10$.

Fig. 6. *Stylosanthes scabra*, $\times 10$.

Fig. 7. *Stylosanthes tuberculata*, $\times 10$.

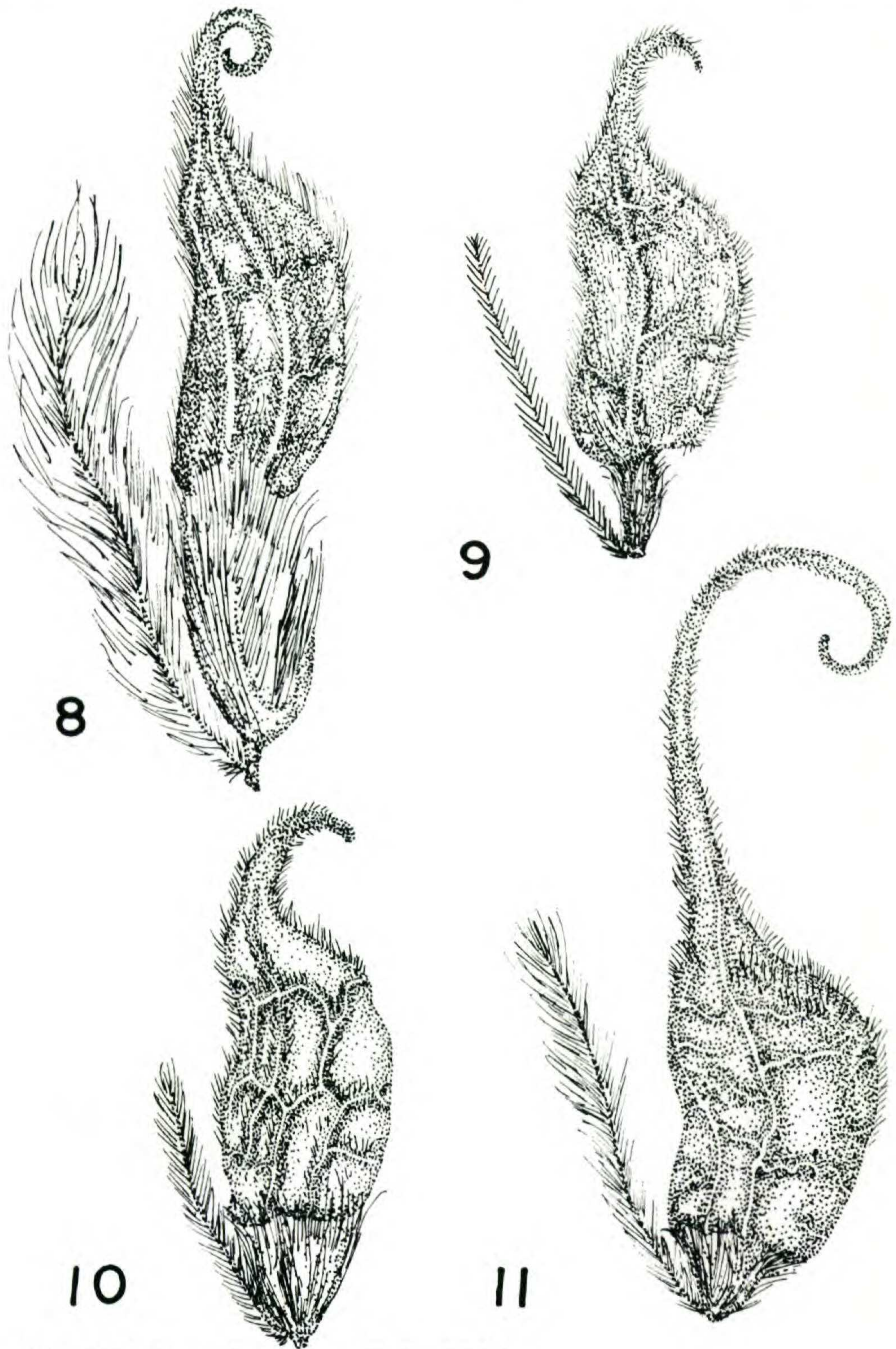


Fig. 8. *Stylosanthes sympodialis*, $\times 10$.
Fig. 9. *Stylosanthes mucronata*, $\times 10$.
Fig. 10. *Stylosanthes fruticosa*, $\times 10$.
Fig. 11. *Stylosanthes sundaica*, $\times 10$.

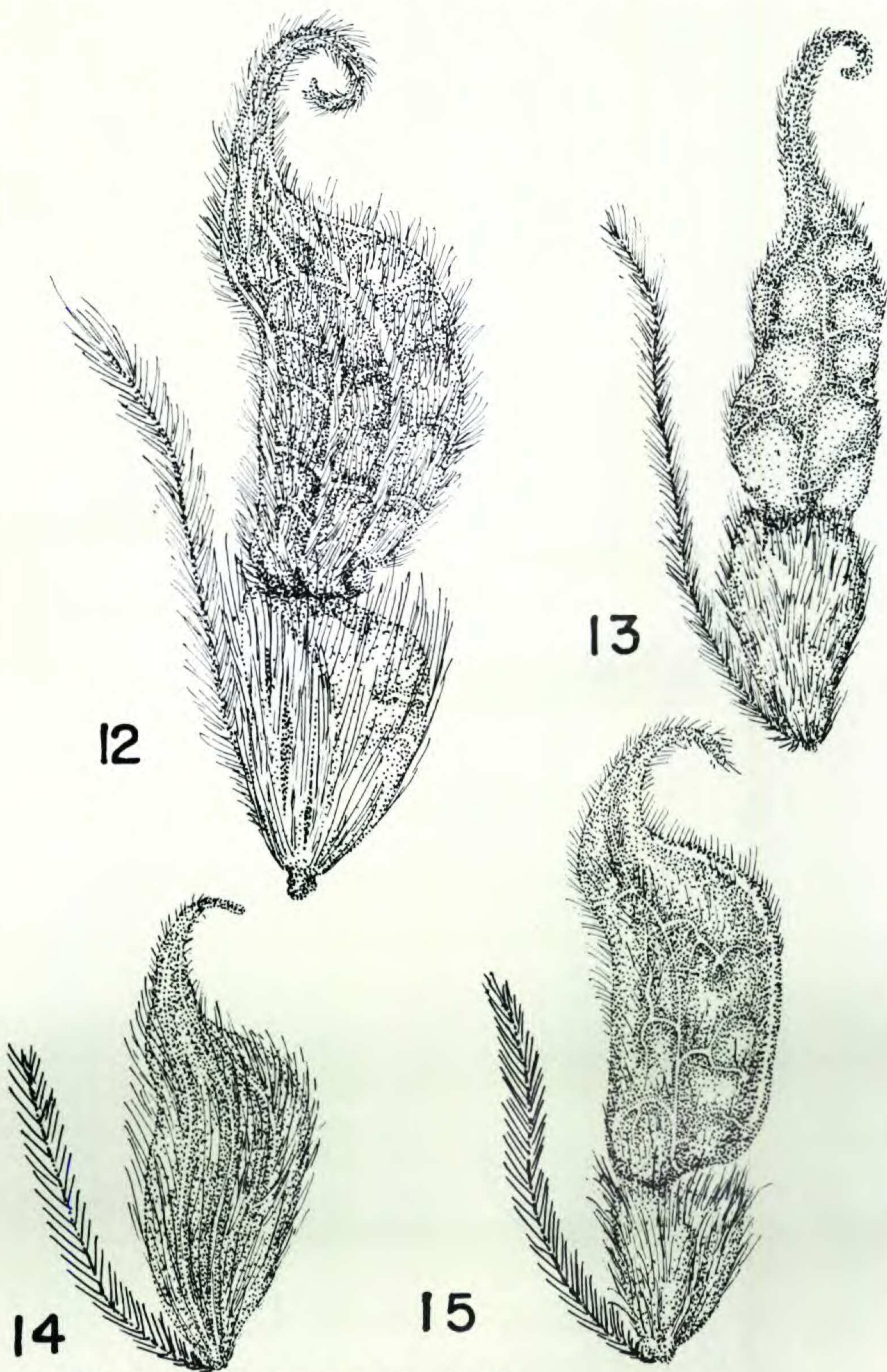
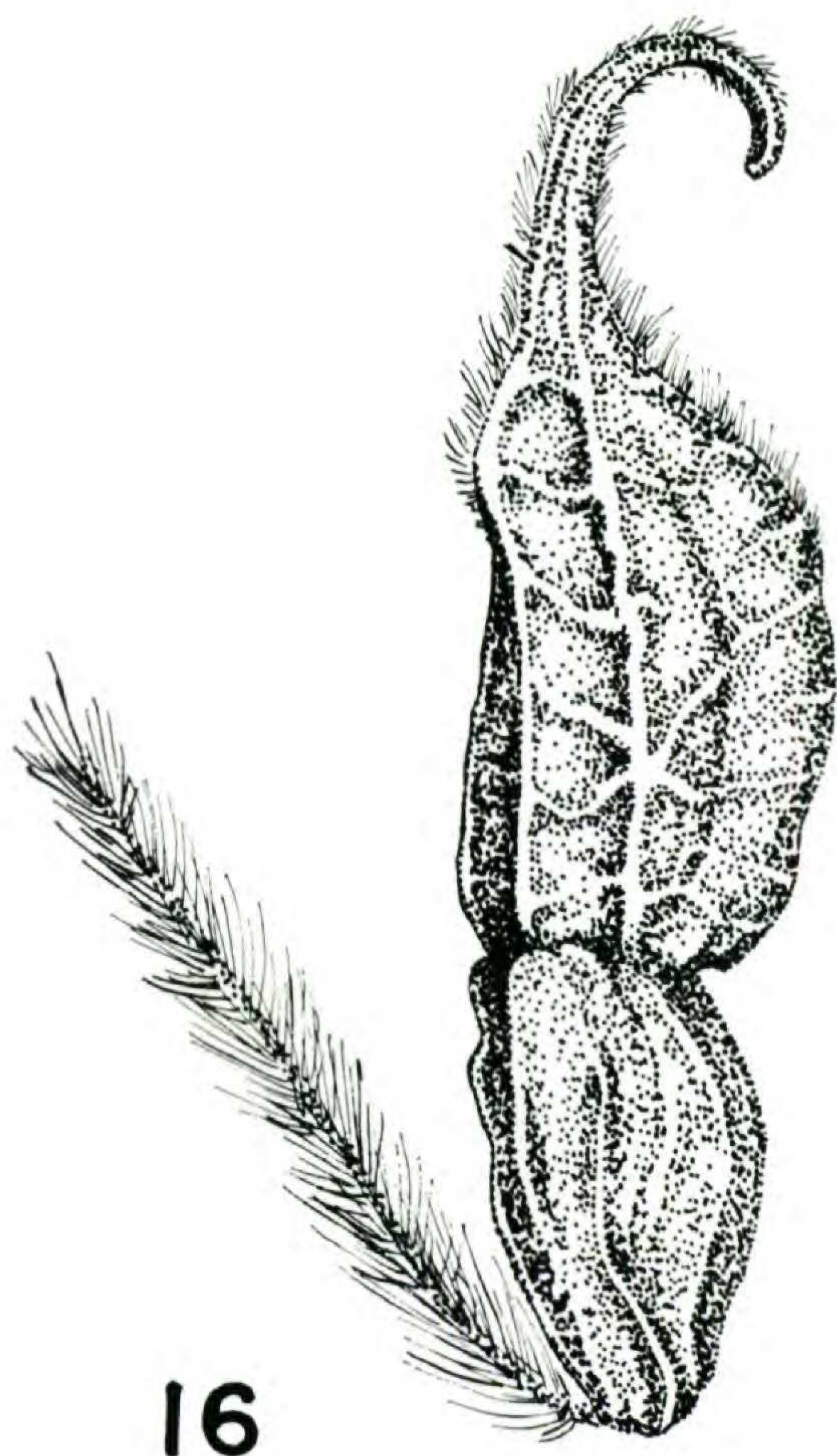


Fig. 12. *Stylosanthes subsericea*, $\times 10$.

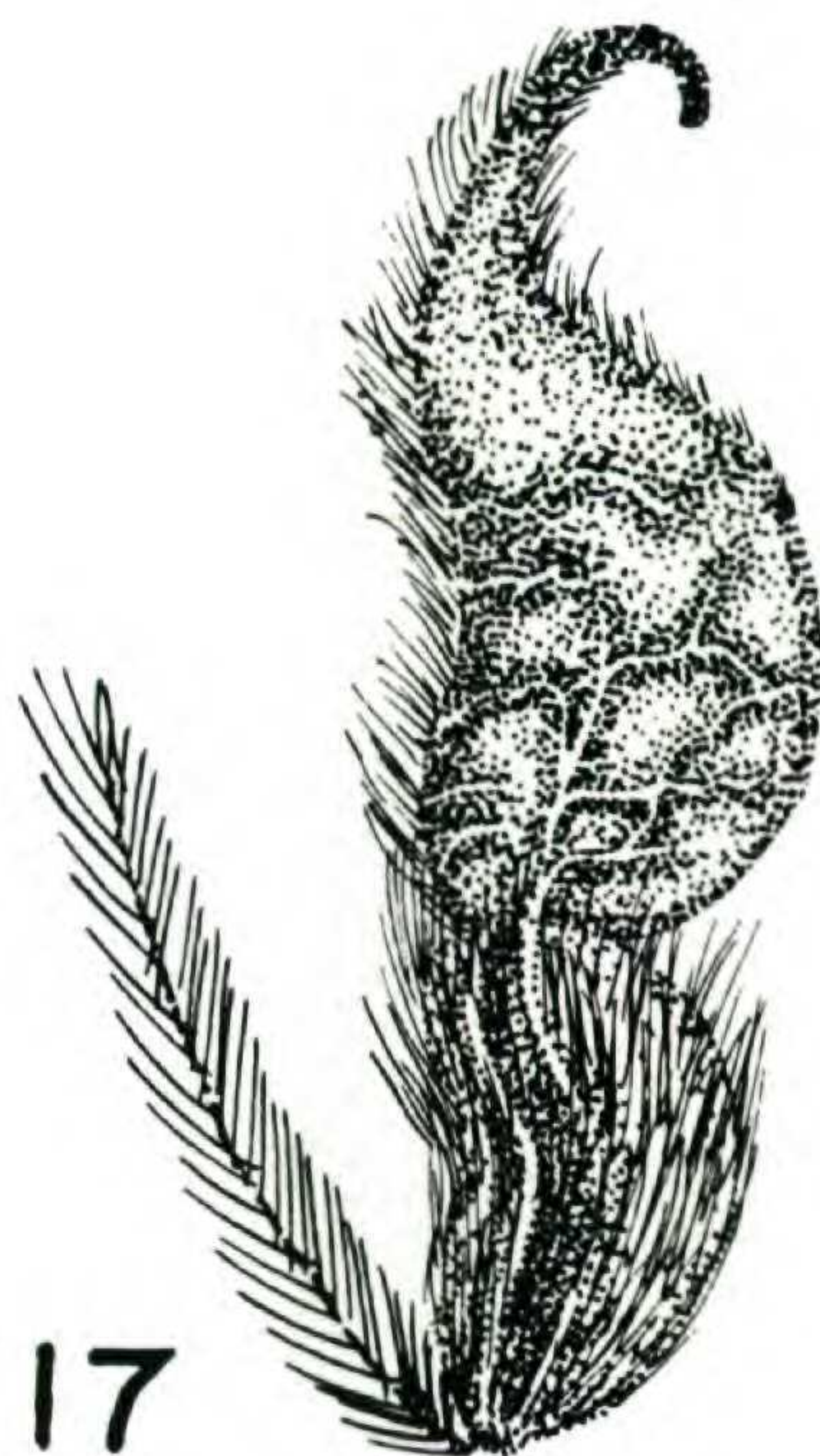
Fig. 13. *Stylosanthes macrocarpa*, $\times 10$.

Fig. 14. *Stylosanthes suffruticosa*, $\times 10$.

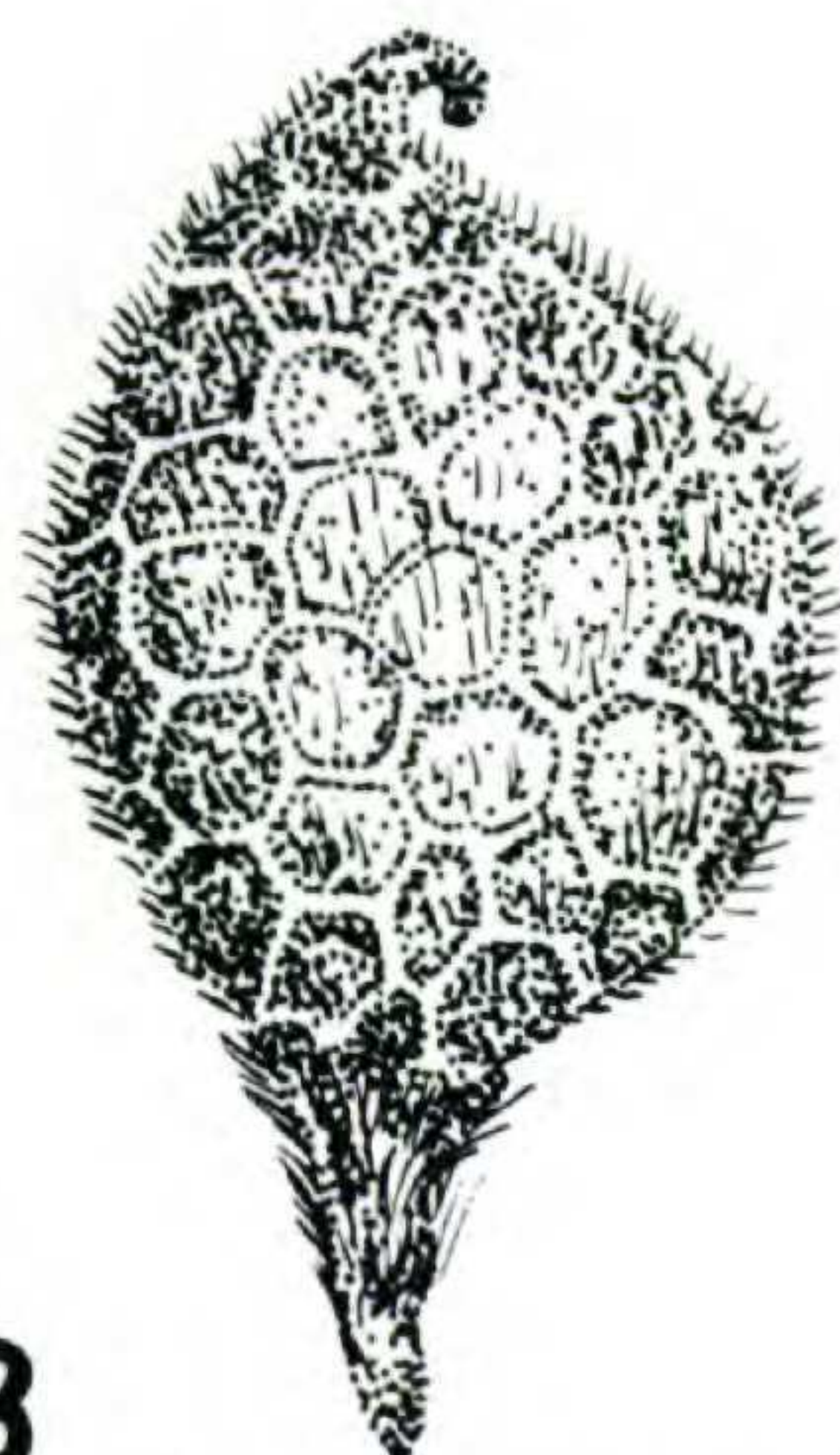
Fig. 15. *Stylosanthes nervosa*, $\times 10$.



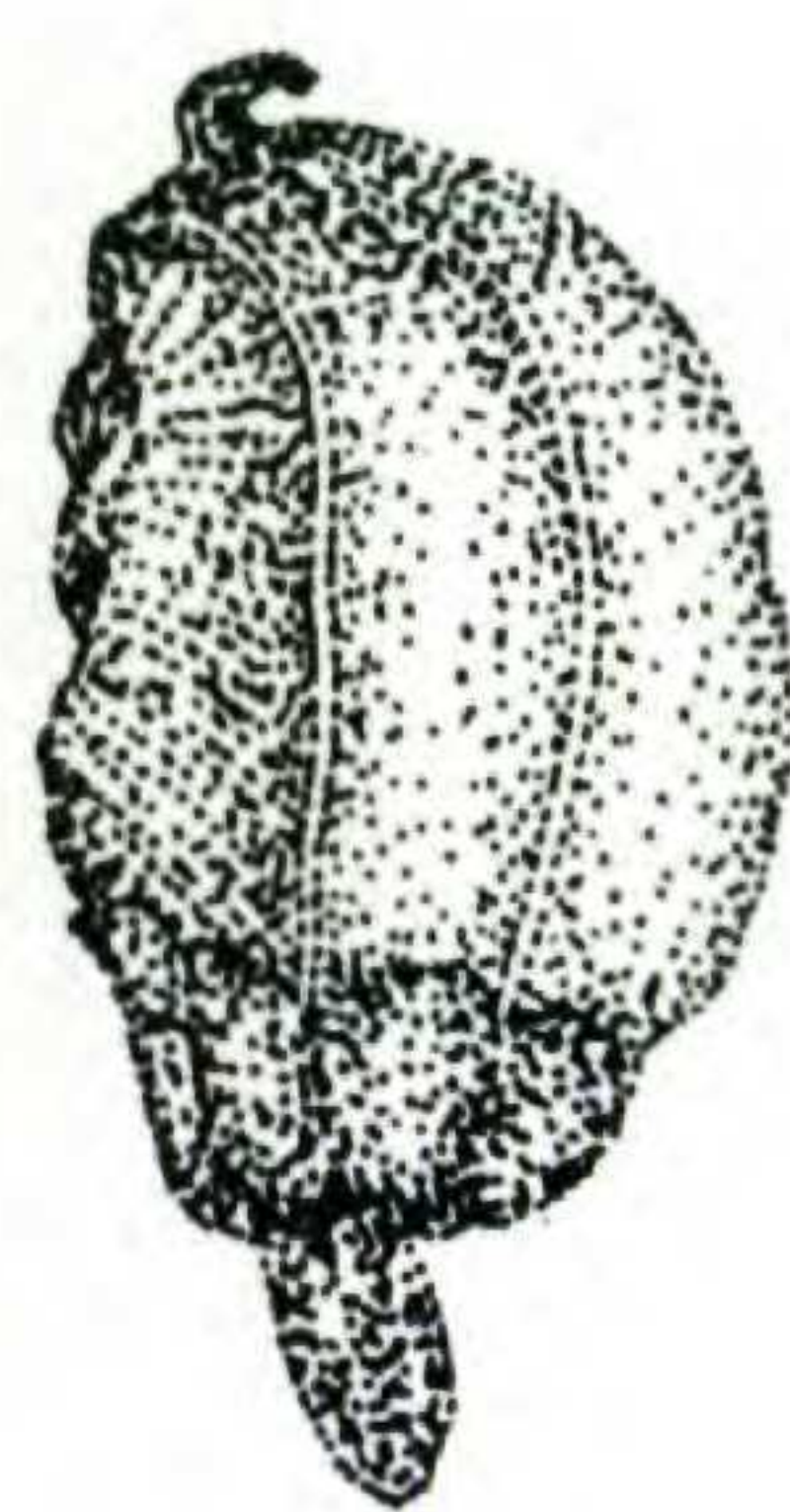
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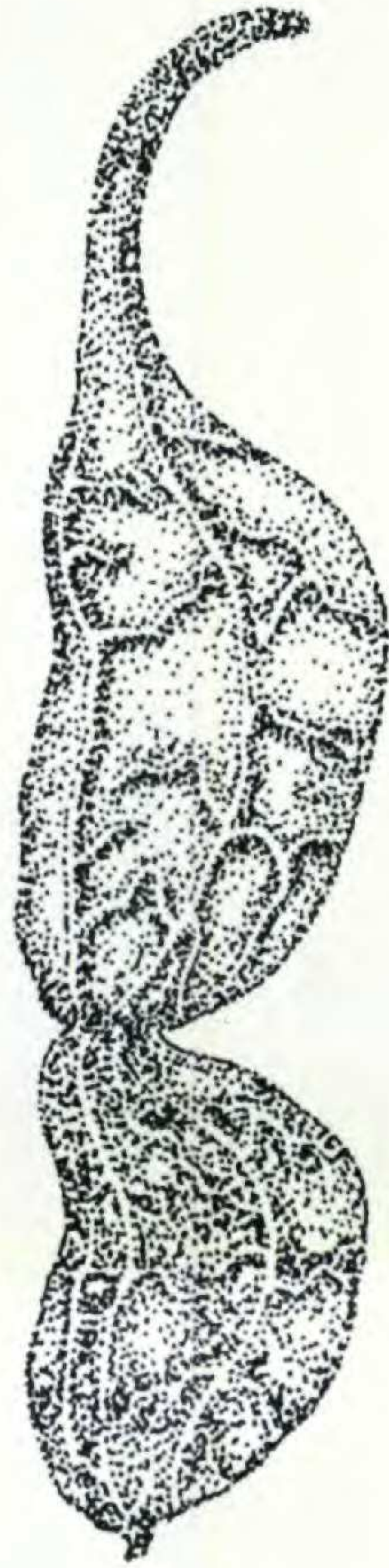
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Fig. 16. *Stylosanthes hamata*, $\times 10$.
 Fig. 17. *Stylosanthes sericeiceps*, $\times 10$.
 Fig. 18. *Stylosanthes biflora*, $\times 10$.
 Fig. 19. *Stylosanthes guyanensis*, $\times 10$.

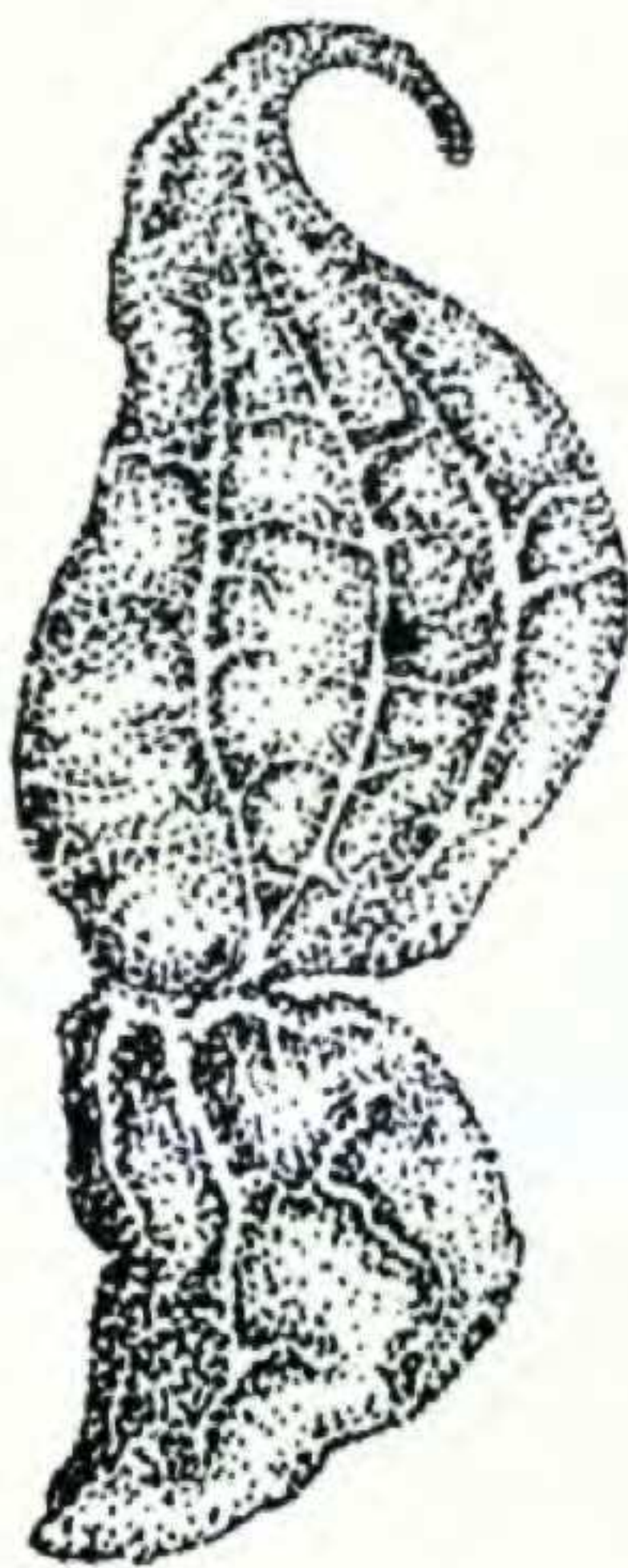
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Fig. 20. *Stylosanthes angustifolia*, $\times 10$.

Fig. 21. *Stylosanthes leiocarpa*, $\times 10$.

Fig. 22. *Stylosanthes cayennensis*, $\times 10$.

Fig. 23. *Stylosanthes hippocampoides*, $\times 10$.

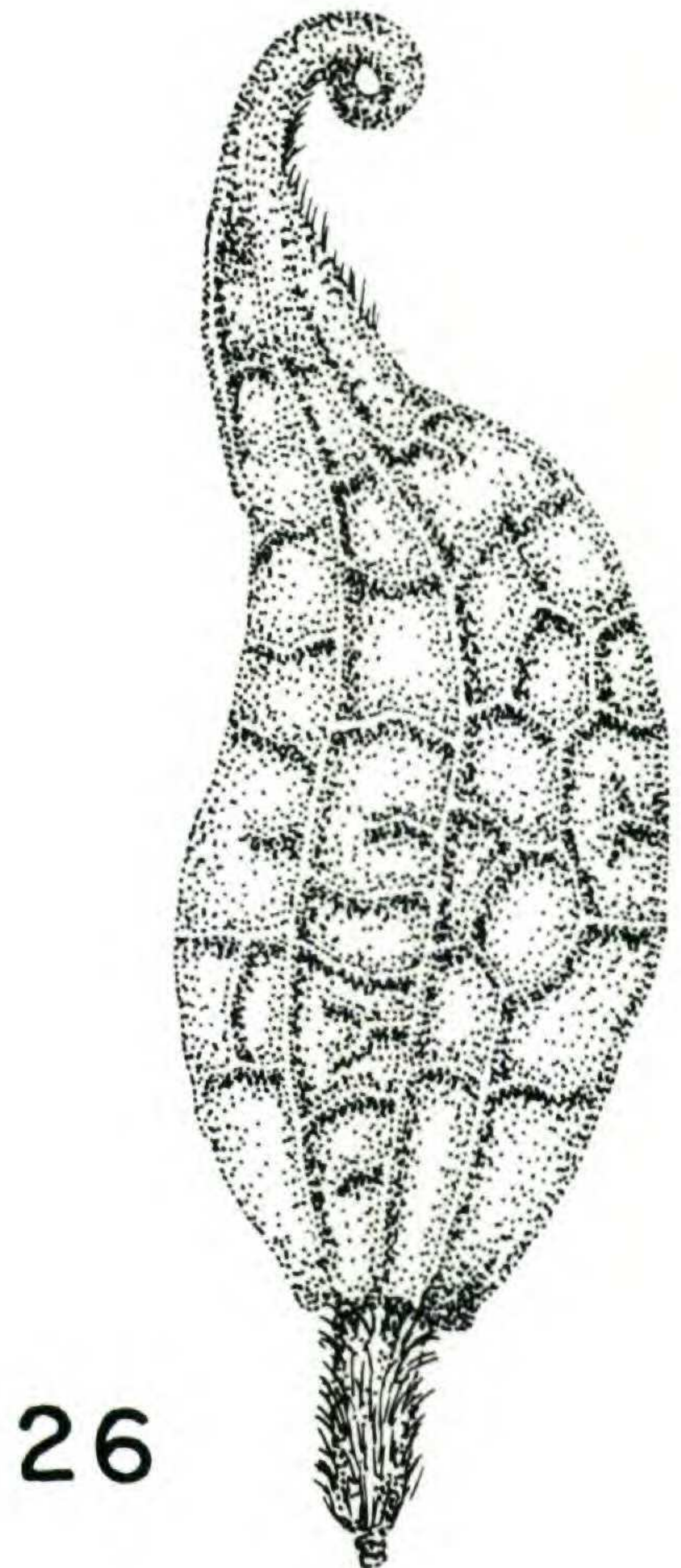
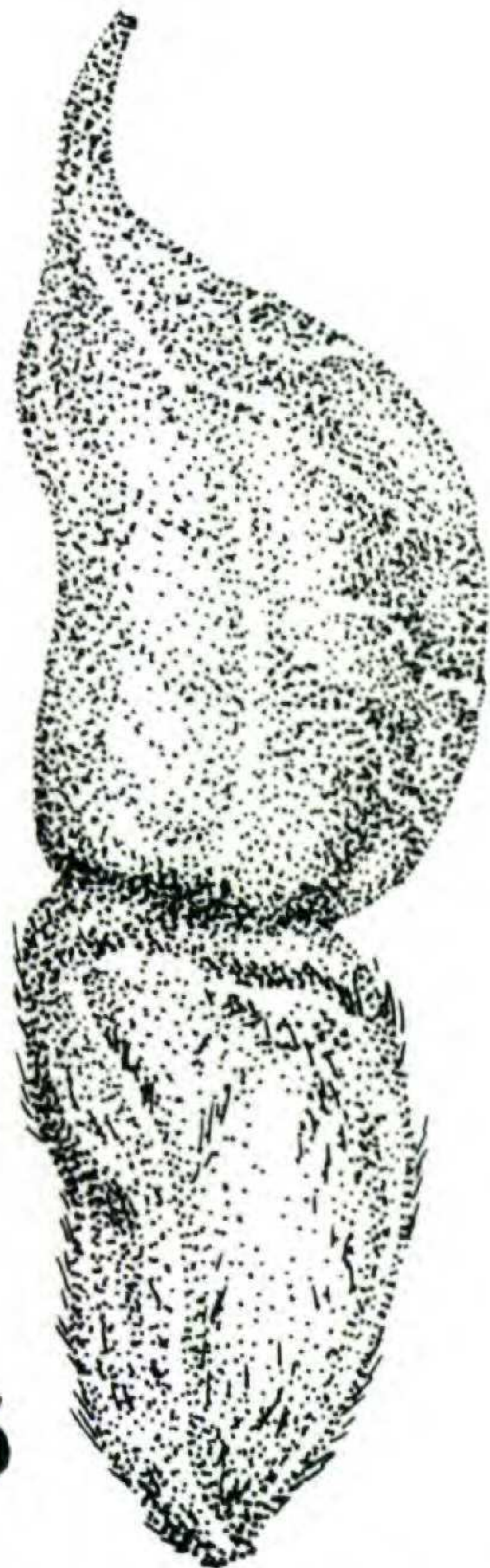
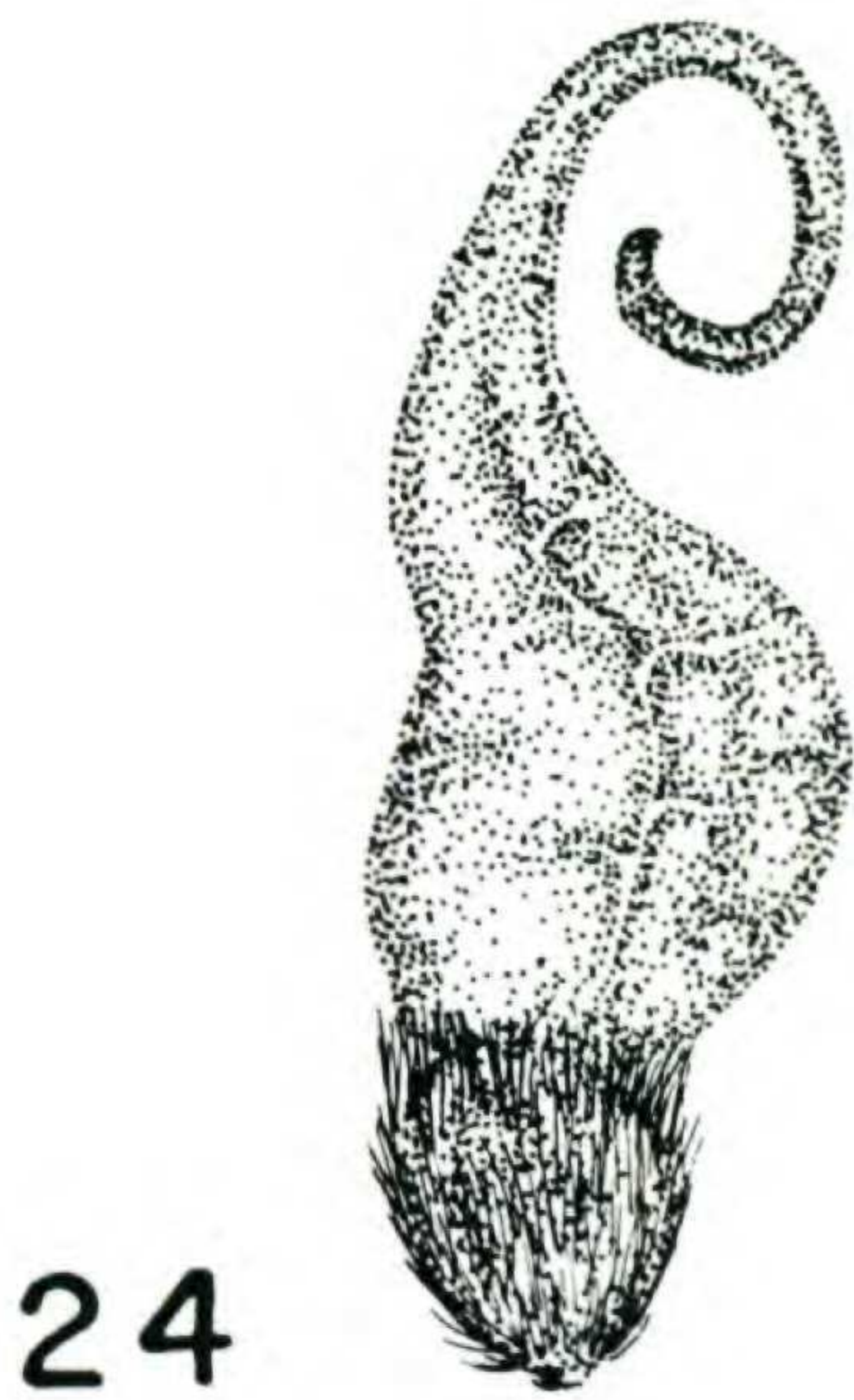


Fig. 24. *Stylosanthes suborbiculata*, $\times 10$.

Fig. 25. *Stylosanthes ingrata*, $\times 10$.

Fig. 26. *Stylosanthes macrosoma*, $\times 10$.

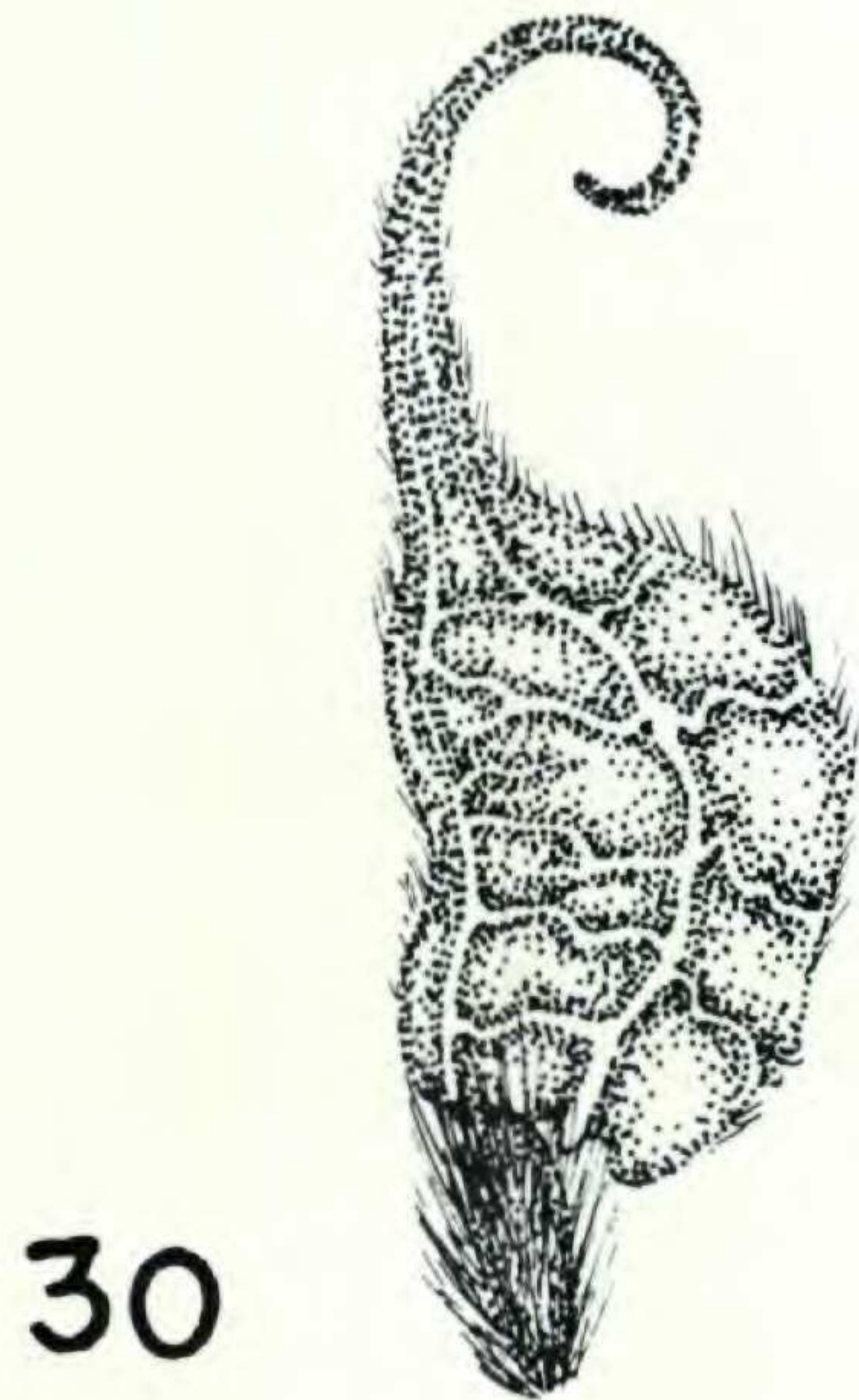
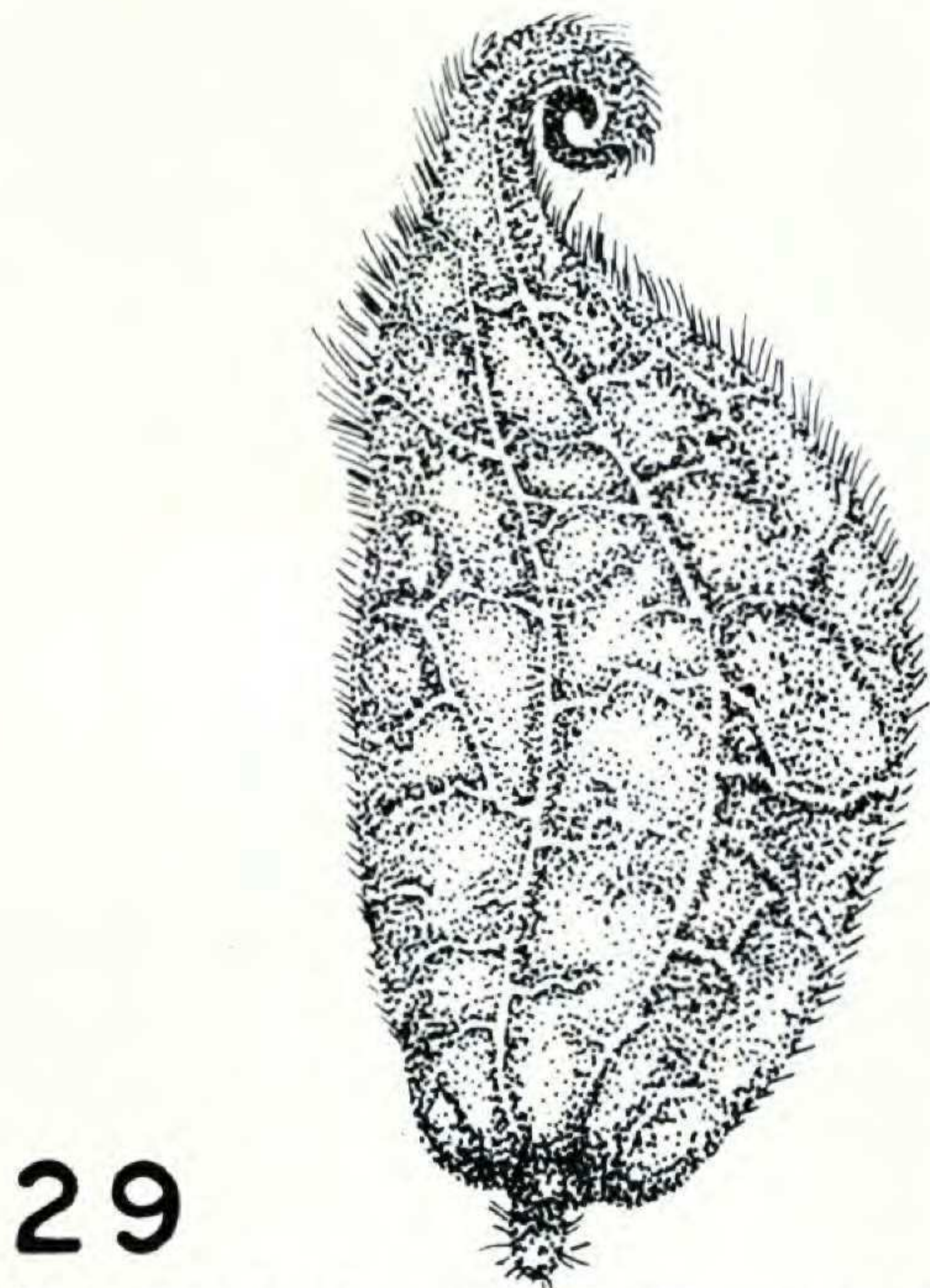


Fig. 27. *Stylosanthes viscosa*, $\times 10$.
 Fig. 28. *Stylosanthes figueroae*, $\times 10$.
 Fig. 29. *Stylosanthes montevidensis*, $\times 10$.
 Fig. 30. *Stylosanthes humilis*, $\times 10$.

- H. Beak of loment about equalling body in length; leaflets suborbicular. Somaliland. (Fig. 24) 24. *S. suborbiculata*
- HH. Beak of loment about one-half as long as the body; leaflets lanceolate to elliptic.
- I. Upper articulation and beak together 3.0-4.5 mm. long; leaflets lanceolate. British Honduras. (Fig. 25) 25. *S. ingrata*
- II. Upper articulation and beak together 5.0-7.5 mm. long; leaflets elliptic. Paraguay. (Fig. 26) 26. *S. macrosoma*
- DD. Loment pubescent (if nearly glabrous, the stem viscid).
- J. Beak shorter than or nearly equaling the upper articulation; stem often viscid.
- K. Stems with viscid hairs or short-hispid; leaflets usually punctate beneath; fertile articulations 1 or 2.
- L. Fertile articulations usually 2, the upper decidedly widest above the middle, the beak circinate, about one-third the length of the upper articulation. Bahamas, Cuba, Central America, Mexico, South America. (Fig. 27) 27. *S. viscosa*
- LL. Fertile articulation usually 1, broadest at or below the middle, the beak nearly straight or slightly uncin-ate, one-half to nearly equaling the upper articulation. Colombia. (Fig. 28) 28. *S. figueroae*
- KK. Stems without viscid hairs; leaflets not punctate; fertile articulation 1. Brazil, Paraguay, Uruguay, Bolivia, Argentina, Colombia. (Fig. 29) 29. *S. montevidensis*
- JJ. Beak nearly 2-4 times longer than the upper articulation; stems not viscid. Central America, Mexico, Bahamas, Cuba, Colombia, Venezuela, Brazil. (Fig. 30) 30. *S. humilis*

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